

Claims

1. A method of manufacturing a safety syringe, comprising the steps of:

a) providing a syringe having a syringe barrel and a needle hub extending from a distal end of said syringe barrel, a needle extending from said needle hub;

b) providing a needle protection housing having a slot extending longitudinally along at least one portion of said housing;

c) providing a collar;

d) attaching said housing to said collar;

e) forming collar reception means circumferentially around a distal portion of said syringe barrel proximate to said distal end; and

f) engaging said collar to said distal portion of said syringe barrel until said collar mates to said collar reception means on said syringe barrel;

wherein said housing is pivotable to a position along the longitudinal axis of said syringe for covering said needle extending from said needle hub of said syringe.

2. Method of claim 1, wherein said collar reception means comprises a groove formed circumferentially about said distal portion, the method further comprising the steps of:

forming the inside diameter of said collar to be of a sufficient dimension so that said collar is rotatable about said groove once said collar is mated to said groove; and

forming at least one protrusion at the inside surface of said collar to make contact with the outer surface of said syringe barrel with sufficient tension to prevent free rotation of said collar relative to said syringe barrel after said collar is mated to said groove of the syringe barrel.

3. Method of claim 1, wherein said housing has a base for connecting to said collar, wherein said step b comprises the step of:
 - providing at least one locking portion at the base of said housing; and
 - wherein said step c comprises the step of:
 - providing at least an other locking portion at the outside circumference of said collar;
 - wherein said one and other locking portions coact with each other to fixedly retain said housing relative to said collar once said housing is pivoted along the longitudinal axis of said syringe to cover said needle.
4. Method of claim 1, wherein said step b comprises the step of:
 - providing a catch member within said housing for fixedly retaining said needle within said housing when said housing is pivoted along the longitudinal axis of said syringe to cover said needle.
5. Method of claim 1, wherein said collar reception means comprises a groove formed circumferentially about said distal portion;
 - wherein said step c comprises the step of:
 - providing a plurality of flanges at the inside surface of said collar; and
 - wherein said step d comprises the step of:
 - press fitting said collar to said groove;
 - wherein once said collar is matingly fitted to said groove, said flanges prevent said collar from being removed from said groove.
6. Method of claim 1, wherein said collar reception means comprises a groove formed circumferentially about said distal portion, wherein said collar has a top surface and said needle is covered by a needle sheath before use, said sheath

having an open end whereinto said needle is inserted when said sheath is fitted to said needle hub, and wherein said step f comprises the step of:

press fitting said collar to said groove such that the top surface of said collar is flush with the distal end of said syringe barrel, the top surface of said collar providing a stop for said sheath when said sheath is fitted to said needle hub to cover said needle.

7. Method of claim 1, wherein said collar reception means comprises a groove formed circumferentially about said distal portion, and wherein said step e comprises the step of;

effecting said groove at said distal portion of said syringe barrel at a predetermined distance from said distal end so that when said collar is matingly fitted to said groove, the top surface of said collar is in substantially coplanar relationship with said distal end of said syringe barrel for supporting a sheath placed over said needle extending from said needle hub.

8. Method of claim 1, wherein said step b comprises the step of:

effecting said needle protection housing to have a proximal portion and a distal portion, said proximal portion having a base pivotally connected to said collar, said proximal portion being semi-circular for covering said needle hub, said distal portion of said needle protection being a channel extending from said proximal portion for covering said needle with said slot being the opening of said channel through which said needle passes when said housing is pivoted to be in alignment along said longitudinal axis to cover said needle.

9. Method of claim 1, wherein said collar reception means comprises a boss formed circumferentially about said distal portion, and wherein said step c comprises the step of:

forming a notch circumferentially at the inner surface of said collar, said collar fitting to said distal portion of said syringe barrel when said notch of said collar mates to said boss at said syringe barrel.

10. Safety apparatus, comprising:

a syringe having a syringe barrel, said syringe barrel having a distal portion and a distal end, a needle hub extending from said distal end, a needle extending from said needle hub, collar reception means formed at said distal portion proximate to said distal end of said syringe barrel, a collar having a needle protection housing pivotally attached thereto matingly fitted to said collar reception means, said housing pivotable to a position along the longitudinal axis of said syringe, said housing having a slot wherethrough said needle passes when said housing is pivoted to said position for covering said needle.

11. Safety apparatus of claim 10, wherein said collar reception means comprises a groove formed circumferentially about said distal portion, and wherein said collar has a diameter slightly larger than said groove so that said collar is rotatable about said groove once said collar is mated to said groove, said collar having at least one protrusion at its inside surface that contacts the surface of said syringe barrel with sufficient tension to prevent free rotation of said collar relative to said syringe barrel.

12. Safety apparatus of claim 10, further comprising at least one locking portion provided at a base of said housing, and at least an other locking portion provided at the outside circumference of said collar, wherein said one and other locking portions

coact with each other to fixedly retain said housing relative to said collar when said housing is pivoted to be in alignment along said longitudinal axis of said syringe to cover said needle.

13. Safety apparatus of claim 10, further comprising a catch member within said housing for fixedly retaining said needle within said housing when said housing is pivoted along said longitudinal axis of said syringe to cover said needle.

14. Safety apparatus of claim 10, wherein said collar reception means comprises a groove formed circumferentially about said distal portion, and wherein said collar comprises a plurality of flanges at its inside surface, said flanges preventing said collar from being removed from said syringe barrel once said collar is fitted to said groove.

15. Safety apparatus of claim 10, wherein said collar reception means comprises a groove formed circumferentially about said distal portion, and wherein said collar has a top surface, the top surface being flush with the distal end of said syringe barrel when said collar is fitted to said groove, said apparatus further comprising a needle sheath for covering said needle before use, said sheath having an open end whereinto said needle is inserted when said sheath is fitted to said needle hub, the top surface of said collar providing a stop for said sheath when said sheath is fitted to said needle hub to cover said needle.

16. Safety apparatus of claim 10, wherein said needle protection housing comprises a proximal portion and a distal portion, said proximal portion having a base connected by a living hinge to said collar, said proximal portion being semi-circular and having a dimension sufficient to cover said needle hub, said distal

portion of said needle protection housing extending from said proximal portion to form a channel for covering said needle with said slot forming the opening through which said needle passes into said channel when said housing is pivoted to be in alignment along said longitudinal axis to cover said needle.

17. Safety apparatus of claim 10, wherein said collar reception means comprises a boss formed circumferentially about said distal portion, and wherein said collar comprises a notch formed circumferentially at its inner surface, said collar fitting to said distal portion of said syringe barrel when said notch of said collar mates to said boss at said syringe barrel.

18. A safety syringe comprising: a syringe barrel having a proximal end whereinto a plunger is movably inserted, a distal portion and a distal end, a needle hub having a smaller circumference than said needle barrel extending from said distal end, a needle fixedly extending from said needle hub, a sheath having an open end engaged to said hub for covering said needle, collar reception means formed at said distal portion proximate to said distal end of said syringe barrel, a collar having a needle protection housing pivotally attached thereto matingly fitted to said collar reception means, said housing pivotable to a position along the longitudinal axis of said syringe, said housing having a slot wherethrough said needle passes when said housing is pivoted to said position for covering said needle after the removal of said sheath from said hub.

19. Safety syringe of claim 18, wherein said collar reception means comprises a groove, and wherein said collar is rotatable about said groove, said collar having friction means at its inside surface that contacts said syringe barrel to prevent said

collar from rotating relative to said syringe barrel without a torque being applied against either said collar or said housing.

20. Safety syringe of claim 18, wherein said housing comprises a base and at least one locking portion provided at said base and wherein said collar comprises at least an other locking portion provided at its outside circumference, said one and other locking portions coacting with each other to fixedly retain said housing relative to said collar when said housing is pivoted to be in alignment along said longitudinal axis of said syringe to cover said needle.

21. Safety syringe of claim 18, wherein said housing comprises an integral catch member for fixedly retaining said needle within said housing when said housing is pivoted along said longitudinal axis of said syringe to cover said needle.

22. Safety syringe of claim 18, wherein said collar reception means comprises a groove, and wherein said collar comprises a plurality of flanges at its inside surface, said flanges preventing said collar from being removed from said syringe barrel once said collar is snap fitted to said groove.

23. Safety syringe of claim 18, wherein said collar reception means comprises a groove, and wherein said collar has a top surface, the top surface of said collar being flush with the distal end of said syringe barrel when said collar is fitted to said groove, the top surface of said collar providing a stop for said sheath when said sheath is engaged to said needle hub to cover said needle.

24. Safety syringe of claim 18, wherein said needle protection housing comprises a proximal portion and a distal portion, said proximal portion having a base

connected by a living hinge to said collar, said proximal portion being semi-circular for covering said needle hub, said distal portion being a channel extending from said proximal portion with said slot forming the opening along said channel wherethrough said needle passes into said channel when said housing is pivoted to be in alignment along said longitudinal axis.

25. Safety syringe of claim 18, wherein said collar reception means comprises a boss formed circumferentially about said distal portion, and wherein said collar comprises a notch formed circumferentially at its inner surface, said collar fitting to said distal portion of said syringe barrel when said notch of said collar mates to said boss at said syringe barrel.